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ABSTRACT

Since 1965, Utah State University (USU) has been developing special programs for moderately and severely hard-of-hearing individuals as distinct from deaf persons. For the 1968-69 academic year, a pilot project was established for 16 students.This project of educational audiology was designed to explore the educational resources of USU, compare hard-of-hearing and hearing students, and compare hard-of-hearing students at USU and Gallaudet College. An analysis was also made of course features and classroom acoustics that facilitated learning. Experience with the program showed that it was feasible to develop an institute for the hard of hearing at a regular university, and that administrative, faculty, and student sources were available to help with the pilot project. A proposal has been made to continue the program for 5 years. (BC)

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PROGRESS REPORT

RD-2766-S-69

UNIVERSITY HABILITATION OF YOUNG HARD OF HEARING ADULTS

UTAH STATE UNIVERSITY

Frederick S. Berg, Ph.D., Project Director

August 20, 1968 - August 31, 1969

Report Prepared - June 27, 1969

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INTRODUCTION

In the United States, the hard of hearing person typically is not obtaining an adequate education to compete in society. Whether in a regular school or in a school for the deaf, he seldom has the advantage of an educational program designed to meet his unique needs. Even when he does have access to special facilitative services, he tends to resist assistance because he has not accepted the reality of his hearing problem with all its concomitant deleterious effects.

Since 1965, Utah State University, located 85 miles north of Salt Lake City and in beautiful Cache Valley, has been developing special programs for moderately and severely hard of hearing individuals as distinct from those of deaf persons. Both the Office of Education and the Social Rehabilitative Service have been highly supportive of this unique development which we have given the name "educational audiology" to distinguish it from deaf education. The OE support has encompassed funding of an extensive summer institute and of a unique professional specialization. The SRS support has encompassed funding of a pilot project in the post-secondary education of hard of hearing students on the campus of Utah State University.

The combination of support from SRS, from 7 state rehabilitation agencies, and from USU itself enabled us to launch the pilot project during 1968-69. By Spring quarter 16 students with educationally significant hearing impairment were either registered for coursework or auditing classes on the USU campus. At least 6 of these students plus 20 additional hearing impaired students, representing 14 states from across the country, plan to enroll at USU and participate in the special project this September, provided a continuation of grant support from SRS is forthcoming.

Hopefully we can move ahead in the establishment of a regional institute for the hearing impaired. An April 30 meeting was held between the project director, Dr. Frederick S. Berg; Chief of Communication Disorders Branch, Dr. Boyce Williams; and Executive Secretary of the Sensory Study Section, Dr. L. Deno Reed. An application for a 5-year continuation of grant support from SRS was presented at the May meeting of the National Advisory Council on Vocational Rehabilitation. The current report is a statement on the progress of the pilot study.

The plan for the next 5 years is to enroll about 25 new hearing impaired students at USU each year. By 1974 the special enrollment would peak at approximately 100. It is believed that other similar post-secondary programs for the hard of hearing would be developed in time as a result of the stimulus given by this prototype program.

In the pilot application, 3 main objectives were encompassed: (a) exploration of educational resources of USU, (2) comparison of hard of hearing students and hearing students at USU, and (3) comparison of hard of hearing students at USU and hard of hearing students at Gallaudet College. The objectives are being partially realized during the pilot year. Each of the objectives as mentioned above, will be reviewed separately below. A more complete report on the pilot investigation will be forthcoming by November, 1969.

OBJECTIVES AND ACCOMPLISHMENTS

I. Exploration of Educational Resources

Within the limits of the $14,793 pilot grant award, a continuing effort has been given to the identification and development of resources on the campus of Utah State University that would support a post-secondary institute for the hard of hearing. In this report, progress on this exploration will be described under 5 main headings as follows: research staff, administrative support, faculty support, student support, and additional facilitative assistance.

A. Research Staff. The nucleus of the project staff consisted of three faculty members and two graduate assistants. A listing of these persons and their responsibilities appears below.

1. Project director, Frederick S. Berg; 50 percent time committment; overall direction in all aspects of the study; presided over weekly staff meetings; served as academic adviser to the hearing impaired subjects; conducted extensive communications and correspondence; held group speech and hearing remedial sessions; gathered research data; spent one week, April 28 - May 2, at Gallaudet College and at the National Technical Institute for the Deaf.

2. Project assistant, Keith Checketts; 10 percent time committment; regular university responsibility for supervision of American College Testing Examinations and for general academic counseling encompassed the hearing impaired subjects; counseled with the project director on course registration and research problems; communicated with the Admissions Office of Gallaudet College; as a member of the USU Admissions Committee, provided continuing clarification on the progress of the pilot project; recommended the selection of another project assistant, a graduate student, to the project director.

3. Project assistant, Thomas C. Clark; 20 percent time committment, primarily through extension teaching; taught a 3-quarter sequence of remedial grammar, remedial composition, and vocabulary building; supervised normal hearing students who provided English tutoring; arranged with Captioned Films for the Deaf for the showing periodically of recreational films; arranged and supervised several recreational events such as skidooing, water skiing, card games, and the like; spent one week during November at Gallaudet College and at the National Technical Institute for the Deaf.

4. Project assistant, Rex Ivory; 50 percent time committment; a graduate student in counseling and testing who assisted with registration, scheduling, course selection, counseling and testing, and counseling with class instructors; supervised student tutoring in selected academic courses; provided special instructional sessions.

5. Project assistant, Jeff Stowe; 50 percent time committment; a graduate student in audiology-speech pathology who assisted with registration, counseling class instructors, supervision of tutoring, and audiological follow up; conducted acoustical analyses of approximately 10 classrooms in which hearing impaired subjects were enrolled; conducted individualized speech remediation.

It should be noted that the latter two project assistants replaced Scott Larsen, an educational audiologist who had agreed to serve as project coordinator but who accepted a position elsewhere because of the lateness of the grant award. In addition, it should be noted that Dr. Samuel Fletcher was to have served as project director with Dr. Berg, principal investigator. Dr. Fletcher, who was Head of the Department of Audiology-Speech Pathology, also accepted a position elsewhere. Thus, Dr. Berg, who wrote the application for the pilot grant, served as investigator, director, and coordinator.

Four young ladies, two regular secretaries and two students, assisted the project staff with secretarial responsibilities. Their total time committment was approximately 30 hours per week. Their responsibilities encompassed budget and billing matters, typing, filing, phone calls, correspondence, and preparation of special materials.

B. Administrative Support. During the project year, the administrator made contact with most of the central administrators of the university, with 3 of the 9 college heads, with 10 of the 50 departmental heads, and with many other university personnel in administrative positions. A listing of these administrators and their support is given below.

1. President, Glen Taggart; as the new administrative head of USU, delegated top administrative contact with the project to his vice president of academic affairs.

2. Vice President of Academic Affairs, Gaurth Hansen; met on at least 3 occasions with the project director; supported authorization for the renovation of existing space for the development of a special learning laboratory and tutorial center for the hearing impaired; authorized compensation for use of vacation time by the project director under extra compensation; suggested appropriate educational adjustments.

3. Vice President of Research, Wynne Thorne; assisted the project director with the application for the grant; clarified University requirements for grants awarded; suggested concentration of facilitative assistance for the hearing impaired to a limited number of study specializations.

4. Fiscal Officer, LaMar Larsen; worked closely with the project director on budget matters related to the pilot project and 5-year project applications.

5. Dean of College of Humanities and Arts, Carlton Culmsee; as project director's dean, discussed project on several occasions, including a meeting at which the vice president for academic affairs, the head of the Department of Audiology-Speech Pathology, the project director, and the dean were present; served as dean to all hearing impaired subjects.

6. Dean of College of Education, Oral Balam; as project director's other dean, discussed project on several occasions; served as liason among the central administration, the head of the Department of Instructional Media-Library Science, and the project director related to hiring a doctoral-level media specialist who would serve half-time on the project during 1969-70.

7. Dean of College of Family Life, Phyllis Snow; discussed with project director the selection of Food Science as an appropriate specialization for hearing impaired female subjects to pursue.

8. Head of Department of Audiology-Speech Pathology; Jay R. Jensen; reduced regular departmental committment of project director to compensate for his work on the project; enabled use of Speech and Hearing Center facilities for remedial work, evaluations, and project headquarters; highly supportive.

9. Head of the Department of English, Thorton Y. Booth; met with members of project staff and his staff relevant to the meeting of Freshman English requirements by hearing impaired subjects; secured central administrative support for setting up a special Remedial English section during Spring quarter.

10. Head of Department of Mathematics, Neville C. Hunsaker; willing to free staff members and set up special sections as necessary to facilitate the progress of hearing impaired subjects.

11. Head of Department of Psychology, Heber C. Sharp; agreed to consider the appointment of Rex Ivory, a project assistant, as a psychology instructor of a remedial reading and study skills class that would carry credit; met with project director relative to hiring a doctoral-level learning specialist who is Director of Research, New Mexico School for the Deaf.

12. Head of Department of Instructional Media-Library Science, Lester C. Essig; supportive of developing working relations of his staff and the project staff; willing to hire a doctoral-level media specialist from Indiana U. who would work half-time on the project during 1969-70.

13. Acting Head of Department of Special Education, Glendon Casto; supportive generally of professional endeavors of the project director, who holds a 25 percent appointment in Special Education.

14. Head of Department of History, Stanford Cazier; serves as administrative assistant to the president and has shown unusual interest in the project; met with hearing impaired subjects in a weekly discussion section of a history class, attended project staff meetings as invited, participated in videotape and wireless microphone activities for the project; continues to offer useful suggestions relevant to the success of the project.

15. Head of Department of Political Science, JeDon A. Emenheiser; together with selected members of his staff, cooperated with project assistant in a political science class, in which 12 of the hearing impaired subjects were enrolled; videotaped lectures were dubbed on audiotapes from which copies of scripts were prepared; assigned one of his staff members, H. Preston Thomas, to hold a special discussion section for the hearing impaired subjects.

16. Head of Department of Civil Engineering, Elliot Rich; father of hard of hearing boy; agreed to be a college spokesman and supporter of hearing impaired students who might choose to follow engineering specializations.

17. Head of Department of Business Education, Theodore W. Ivarie; highly supportive of developing working relationships with the project director; has set up a special typing section for hearing impaired subjects for the Fall of 1969.

18. Director of Space Allocation, Ellvert Himes; authorized the renovation of approximately 1500 square feet of space below the Speech and Hearing Center as a special learning laboratory and tutorial center.

19. Director of University Admissions, Mark L. Neuberger; invited project director to explain admissions problems and special considerations for hearing impaired subjects; assigned Admissions Officer to work closely with project director in consideration of each hearing impaired applicant or subject on warning or probationary status.

20. Manager and Coordinator, Housing, William W. Skidmore; has permitted hearing impaired subjects who did not qualify for housing to live on campus under special arrangements.

21. Director of Comptroller's Office, Sylvan Erikson; supported the establishment of a special tutorial account as a supplement to grant funds; supervised the billing of funds authorized from state rehabilitation agencies for tuition and fees.

22. Manager of University Bookstore, Dean Haslem; cooperative with project director in acquisition of special materials for the hearing impaired subjects.

Strong administrative support for the project was evidenced on numerous occasions. Problems which arose from time to time as hearing impaired subjects and staff members interacted with other university personnel but were typically easily solved. However, only one administrative problem prevented the meeting of a project goal; namely, an intensive evaluation scheduled prior to the academic year was not held. The new administration was unwilling to permit the faculty members of the project staff, with the exception of the director, to receive extra compensation available for this purpose through the grant award. It is anticipated that clearance can be obtained for this year as necessary.

C. Faculty Support. During the project year, approximately 50 university faculty members taught one or more hearing impaired students in a regular or special class. Members of the project staff consulted closely with many of these faculty members and somewhat with all of them. Table 1 presents course features utilized by 10 of these faculty members.

Table 1. Course Features Utilized By Ten Faculty Members That Facilitated Learning By Hearing Impaired Subjects

	Facilitative Feature	Professor and Course 1	2	3	4	5	6	7	8	9	10	Total
1.	Well organized course presentation	x	x	x	x	x	x	x	x	x	x	10
2.	Availability of course syllabus			x			x					2
3.	Reading materials cover content	x		x			x					3
4.	Communicates effectively	x	x	x	x	x	x				x	7
5.	Adequate eye contact	x	x	x	x	x	x				x	7
6.	Uses well-formed lip movements			x					x			2
7.	Lectures loud enough	x	x	x	x	x	x				x	7
8.	Consistently uses visual aids	x			x	x	x		x	x	x	7
9.	Monitors notetaking and tutoring			x	x		x					3
10.	Grades on basis of information and/ or skills acquired and not on basis of reading comprehension.	x	x	x	x	x			x			6
	Total	7	5	9	7	6	8	1	4	3	5	
	Typical grade	Pass	Fail	C	C	C	E	F	D	C	D	
	Number subjects	7	8	10	3	5	10	1	3	1	1	

Table 1 reveals at least two tentative findings as follows:

1. Faculty members varied widely in the utilization of course materials and procedures that might facilitate successful achievement by hearing impaired subjects. For example, the professor of course 1 employed 7 of the 10 features and the professor of course 7 only 1. It is interesting to note that the corresponding typical grades achieved by subjects in these two classes were C and F respectively.

2. The consistency with which these facilitative provisions were utilized varied widely from feature to feature. For example, feature 1 was employed in all instances, whereas features 2 and 6 were used by only two professors.

Additional features of each of the 10 courses referred to in Table 1 will be described further below.

1. Remedial Mathematics; presentation less ambiguous than that of most other classes because of extensive emphasis given to working out problems on the chalkboard.

2. Remedial English; as a group the subjects enrolled in this course were not ready for it because their syntactical and vocabulary skills were inadequate; content was presented as a special section for the hearing impaired subjects only.

3. Reading and Study Skills; original reading materials for use in this course were too advanced for the hearing impaired subjects enrolled; materials were modified for use with hearing impaired subjects; professor met in extra sessions with tutors and subjects.

4. Introduction to Library Science; classroom contained unusual provision for use of visual aids; professor modified his lecture presentation to include extensive use of projectors, once he became aware of the facilitative effect of such a change.

5. American Civilization; because of his unusual interest in students and in our particular project, this past "professor of the year" held weekly discussion sessions with hearing impaired subjects, assisted in experiment with a wireless microphone and in an experiment with video equipment, both of which will be described later; used overhead projector and loudspeaking system as standard lecture procedure.

6. Fundamentals of Political Science; unique in that all lectures were presented by use of videotape in that team teaching and extensive material was covered, in that scripts of lectures were distributed to subjects before they were presented, and in that project assistant participated heavily; one of the professors held weekly discussion sections with subjects and participated in video experiment of the project.

7. Introduction to Anthropology; taught by a hard of hearing female professor who seemed to reject the hard of hearing subject enrolled even though she had indicated prior empathy for the special needs of our students.

8. Introduction to Art; lights were out during much of the lecture time because extensive use was made of slides and motion pictures; many of the slides were duplicated for use in tutoring sessions.

9. Introduction to Drafting; foreign graduate student serving as professor was impatient with the hearing impaired subject even though this student applied himself intensively and received excellent tutoring assistance.

10. Introduction to Landscape Architecture; professor participated in video experiment of the project

C1. Faculty--Audiological. Our 2 Ph.D. audiologists have expressed strong interest in participating on a long-term basis in the project. One of them, Dr. Richard Taylor who is Director of Clinical Services of the Department of Audiology-Speech Pathology, supervised a graduate student who conducted audiological evaluations of the hearing impaired subjects during the pilot study. Dr. Steven Viehweg, the other audiologist and coordinator of another research project, did not assume an active interest in this project this year. Both Dr. Taylor and Dr. Viehweg have agreed to participate full-time in a planned week-long evaluation of 25-30 hearing impaired students the week prior to Fall quarter, 1969. They have also agreed to supervise advanced audiological students who will conduct follow-up tests and hearing aid checks.

C2. Faculty--Speech Devices. Mr. Duard Woffinden, Research Engineer of the Utah Water Research Lab, is working closely with the project director on the development and acquisition of speech aids for use on the project. Together with Mr. Wayne Noble, Senior Research Technician of the Utah Water Research Lab, he has built an electro-sensory device designed after the Voice Visualizer for use in the speech remedial aspect of the project. In addition, he arranged for the loan of an expensive polaroid camera and shield so that photographs and oscilloscopic patterns for selected sounds could be made. Our decision to have local personnel build the Voice Visualizer device was based on their nearby availability to maintain this equipment when it needs repair or adjustment. We plan to have these electronics specialists build additional electro-sensory devices for the project.

Mr. Jack Alvard, a graduate student in the Psychology Department, has also assisted in the remedial speech aspect of the project. As a behavioral management specialist, he has been working closely with Dr. Jensen, Head of the Department of Audiology-Speech Pathology and students majoring from this department. He recently completed a week-long workshop on precision teaching with Dr. Ogden Lindsley of Kansas.

Dr. Donald Mowrer, a speech pathologist from Arizona State University, has also consulted with the project staff on behavioral management. Two units of a cummulative reinforcement indicator demonstrated and discussed by Dr. Mowrer at the recent American Speech and Hearing Association Convention were purchased. Also, considerable material from a forthcoming book by Dr. Mowrer was acquired for use on the project.

Further information on faculty and speech remediation is described in the project plan and supporting data submitted as the proposal for the 5-year continuation study. The University recently awarded the project director a $2025 grant for a proposed research study entitled "Evaluation of Sensory Aids for the Improvement of Speech Competencies of Young Hearing Impaired Adults." This study is planned as a part of the proposed 5-year study submitted to SRS.

C3. Faculty--Video Activities. Two video activities related to the success of the project are ongoing. One is being conducted by Mr. Ted Hansen of the USU Radio and TV Center. It is the video taping and playback of lectures of selected courses. To date, an introductory course in political science has been completely videotaped as well as 20 lectures of an introductory sociology course. Both scripts and outlines of the lectures in the political science course were available to our students prior to their attending a given videotaped lecture itself. A project assistant utilized the script and outline extensively in conducting daily sessions with the subjects during the Spring quarter.

The second video project is being conducted with the use of equipment housed in the USU Speech and Hearing Center. It is the videotaping of interviews between the project director and professors in whose classes subjects might be enrolled. A mini-lecture results from each interview in which the nature of the given course is described. To date, 10 mini-lectures are on videotape and available for playback. This project serves at least 3 purposes: (a) identification of optimal courses for hearing impaired students, (b) modification of instructional behavior, and (c) evaluation of competence of hearing impaired subjects in the understanding of lecture presentations. The results of a test related to the third purposes is presented in Table 2.

Table 2. Number of Correct Written Responses By Hearing Impaired Subjects to Twenty-four Questions on the Content of Three Mini-Lectures.

Subject	Percentage Correct Responses			
	Professor One	Professor Two	Professor Three	Total
1	100	50	83	75
2	50	50	50	50
3	63	40	33	46
4	87	60	67	71
5	75	11	67	46
6	75	80	67	75
7	100	80	100	92
8	38	80	83	67
9	63	40	50	50
10	50	60	17	45
11	63	20	83	50
12	63	30	67	50
13	38	50	33	42
Group	66	50	60	58

The data remain to be statistically analyzed. However, subjective perusal of this information seems to indicate a significant difference in the visual communicative competencies between one of these professors and the other two. The data also seem to indicate that the subjects generally understood much of what these professors said.

C4. Faculty--Hearing Aid Project. The assistance of many professors is being sought by the project director in the evaluation of various types of electro-acoustic amplification systems in classroom settings. This aspect of the project commenced during December, 1968, when a wireless system developed by the Electronic Development Corporation of Salt Lake City was demonstrated by their sales representative in Dr. Stanford Cazier's history class. The attachment of the wireless microphone on Dr. Cazier's lapel and placement of the accompanying FM transmitter in his shirt pocket provided Dr. Cazier with more flexibility than the lecture microphone he ordinarily used. However, interference of unwanted signals on the FM band of the wireless system was experienced. Further investigation with this type of system will be made.

The assistance of Dr. Richard Reese, who is teaching Introductory General Psychology to a large class in which 6 hearing impaired students are enrolled currently, will be contacted for demonstration of an Acousta wireless amplification system available on loan from the Department of Audiology-Speech Pathology. Up to 2 microphone-transmitter units and 10 student receiver units can be employed. There is reason to believe that such a system as the above will enable hard of hearing subjects to comprehend more of the lecture content. This might be particularly true in the instance of a professor such as Dr. Rees inasmuch as one of the 6 hearing impaired students has commented that he should speak more loudly. This student is wearing a wearable hearing aid which is not receiving speech signals from Dr. Rees optimally.

C5. Faculty--Acoustical Analyses. During February, 1969, the project director held a meeting with Dr. Larry Cole, Acting Dean of the College of Engineering, on the topic of acoustical analyses of campus classrooms. Also attending were Drs. Taylor and Viehweg, audiologists, and Mr. Jeff Stowe, project assistant. Dr. Cole presented a lecture on guidelines of acoustical analyses and offered use of reference materials and equipment for this aspect of the project.

Thereafter, a Heathkit Model IG-B2 signal generator and a 16" Electro-Voice speaker were attached and utilized by Mr. Stowe for classroom sound diffusion analysis. Mr. Stowe secured the assistance of 10 professors in whose classes the hearing impaired subjects were enrolled. A copy of a form developed by Mr. Stowe for this analysis appears as Table 3. It may be noted that this analysis was conducted in the classroom used by Dr. Kent Wood of the Instructional Media-Library Science Department.

Table 3. Classroom Acoustical Analysis

General Information

Winter Quarter 1969

Room No. Library 204 — Room unoccupied 58 (dB.)

Subject Taught Intro. Lib. Sci. — Room student occupied 66 (dB.)

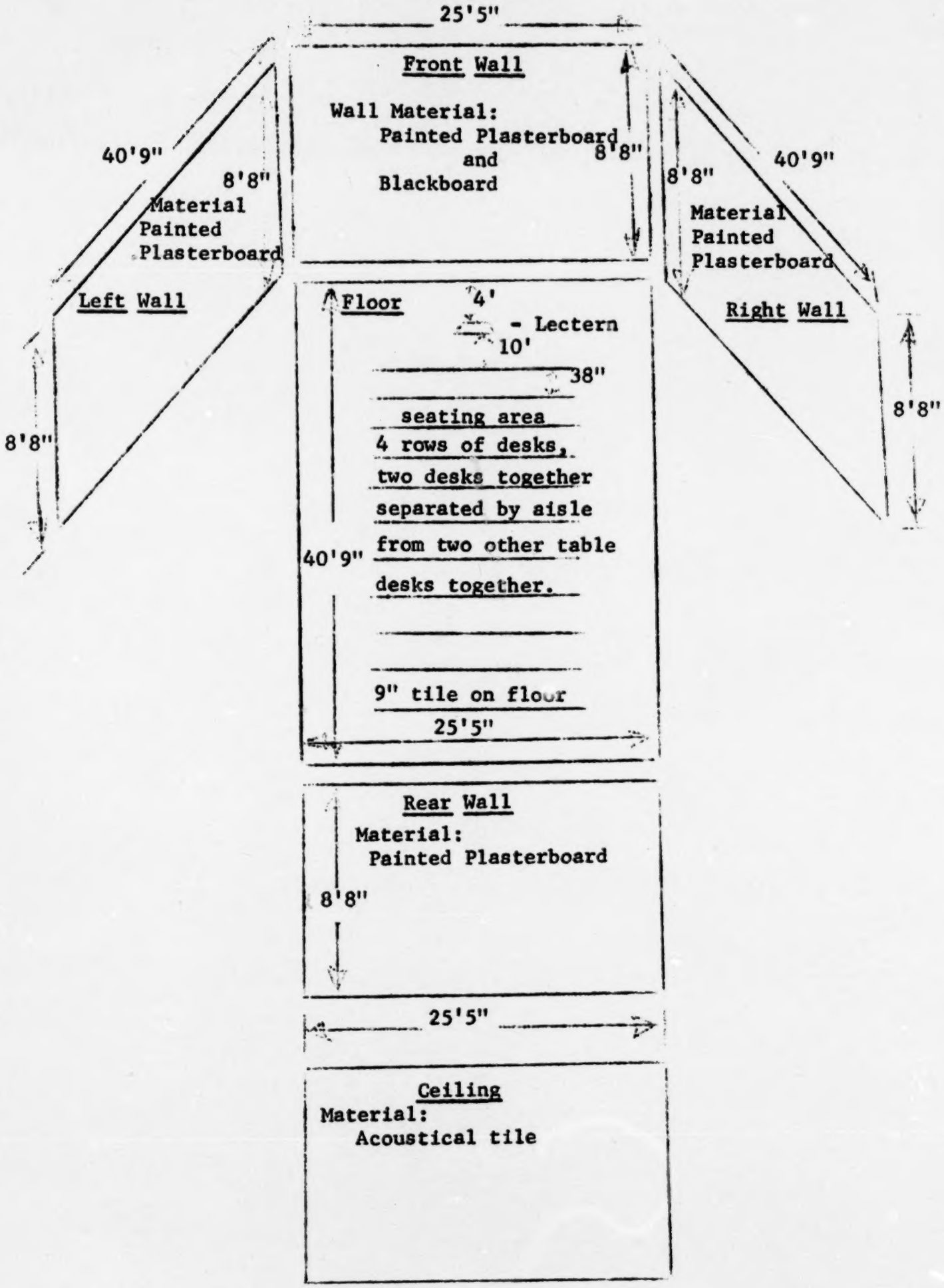
Instructor R. Kent Wood — Instructor speaking 72 (dB.)

Comments or other information: This particular room is especially suited for instruction to hard-of-hearing students because of the many pieces of video equipment in the room. The equipment is frequently used because of the orientation in this area on behalf of the IMLS department.

Sound Diffusion Analysis
(pure tones)

Source Tone:		500 hz.	1000 hz.	2000 hz.	4000 hz.
Intensity (dB.)	Location				
90	Source	90	90	90	90
90	Row 1	75	71	67	73
90	Row 2	71	69	75	64
90	Row 3	72	68	64	67
90	Row 4	60	68	71	66

Table 3. Continuation
ROOM DIMENSIONS



C6. Faculty--Specializations. As the pilot project has progressed, evidence seems to indicate increasingly that a concentration on several specializations would be desirable in a post-secondary program such as ours. Therefore, a continuing effort is being made by the project staff to identify an optimal nucleus of study programs for the institute. An emphasis is being placed on both innovation as well as on employment of current programming. Within a given department certain competencies could be stressed so that the hearing impaired person could assume a particular position for which he would be well suited.

An example of a desirable specialization might be that of an educational technologist who should find no difficulty in filling a critical need in schools for the hearing impaired. The speciality might encompass competencies within study programs of the departments of Audiology-Speech Pathology, Instructional Media-Library Science, and Electronics. The major could be educational audiology, and a certificate for teaching the hearing impaired could be achieved through the Department of Audiology-Speech Pathology. Two faculty members from these departments and one from a nearby high school faculty offer pertinent support for such an endeavor as follows:

1. Donald Smellie, Instructional Media-Library Science; Ph. D. media production specialist from Indiana University; assisted one of the hard of hearing subjects who audited a Junior-Senior level audio-visual production class; supportive of securing a second Ph. D. media production specialist, Dee Hardin from Indiana University, who would assist with the project; supportive of developing a regional media center for the hearing impaired at USU.

2. LeRoy France, Electronics; has worked closely with project director in other pursuits; teaches electronics sequence to selected majors in Audiology-Speech Pathology; officed below Speech and Hearing Center in Mechanical Arts Building where electronic laboratories are located.

3. Oral Maughan, Skyview High School vocational instructor; part of teaching load includes a 2 hours/day/year electronics track; developed many teaching aids for his classes; desires to and has administrative support for integrating our hearing impaired students into his vocational track class; also desires to cooperate with the project staff in the development of additional instructional aids.

Other promising specializations where faculty support for the project currently exists in within departments of accounting, art, business education, civil engineering, food service, industrial technology, landscape architecture, physics, psychology, statistics and computer science, and wildlife resources. These and other specializations will be explored to identify perhaps 4-6 programs wherein most of the USU hearing impaired subjects would be advised. Exceptionally capable hearing impaired subjects would be permitted to follow any USU specialization available.

The selection of suitable specializations will be influenced in part by an ongoing investigation of career opportunities for the hearing impaired. Table 4 summarizes busineasses and services with which we have initiated correspondence.

Table 4. Professional Areas of Specialization Recommended or Not Recommended By 17 Business and Service Agencies.

Source	Location	Positions Available or Recommended	Positions Not Recommended
1. Chevron Oil	S.L.C., Utah	Drafting, Electronics, Research, Tech. Writing, Math, Library Service.	Refining and Marketing; Safety and Commun. Problems.
2. Forest Service	Ogden, Utah	Certain areas of engin., Landscape architecture, Business administration.	
3. Land Mgmt.	Denver, Col. SanteFe, N.M. Phoenix, Ariz.	Mapping and Drafting; some positions in Acct., Agric. econ., Lab positions in Geology; Computer specialist.	Most professional positions requiring constant contact with the public.
4. Hughes Industrial Complex	5 Western locations	Engineering disciplines.	
5. Ford Motor Co.	Dearborn, Mich.	Draftsman, certain Acct. functions, repet. Clerical operations.	Depending on degree to which person is handicapped.
6. School of Engineering, Ariz. St. U.	Tempe, Ariz.	Engineering design, Accountant.	Technical representative.
7. Soil Cons. Service	Phoenix, Ariz	Budget and Fiscal work.	Positions requiring work around construction machinery, Public contact work.
8. Air Force Acct. & Finance Center	Denver, Col.	Areas of Auditing and Reporting, Graphics.	Systems accounting.
9. Geological Survey	Denver, Col.	Geologists, Geophysicists, Chemists, Mathmaticians, Engineers.	
10. Pratt & Whitney Aircraft	East Hartford, Conn.	Analytical or design work.	Experimental or laboratory work; hazardous conditions.
11. Office of Rehab. Services	S.L.C., Utah	Chemistry, Electronics, Engineering, Physics, Math, Accounting, Social Work.	

Table 4. Continued

Source	Location	Positions Available or Recommended	Positions Not Recommended
12. Indian Health Service	Albuquerque, N. M.	Medical technology.	
13. Social Security Admin.	Denver Region	Mathematics, Electronic data processing programmers and analysists, Data review technicians.	When oral communication is a basic requirement.
14. Army Depot	Pueblo, Col.	Engineers, Computer specialists, Accountants, Chemists, Electronic technicians.	
16. Hill Air Force Base	Utah	A few positions in Math, Industrial areas. Physics, and Engineering.	
17. Dept. Air Force	Andrews AF Base, Wash. D. C.	Technical writers and Editors, Engineering drafting, Illustrators, Accountants, Computer programmers and Systems analysists, In-house research oriented to scientific and engineering, Research and cataloging librarians.	

D. Student Support. At least 50 normal hearing students have assisted with tutoring, notetaking, speech, and evaluative activities of the project. This assistance has been provided by 13 graduate students and 37 undergraduate students. Twenty-three majors in Audiology-Speech Pathology conducted the great majority of the communication evaluation and remediation. Similarly, 27 non-departmental students carried out most of the special assistance to academic coursework. Typically, the latter students were either normal hearing classmates of the hearing impaired subjects or students who had done well in these classes previously. Table 5 summarizes this activity.

Table 5. Summary of Supportive Assistance Provided By Students Who Were Not Project Staff Members.

Course or Activity	Credits	Number Subjects	Number Tutors of Aud-SpPath Students Underg.	Graduate	Estimated Hours	Number Note-takers	Script Typists
1. Audiolog. Eval.		15		1	60		
2. Reading Eval.		9		1	18		
3. Speech Eval.		16	5	1	30		
4. Vocab. Eval.		13	6	2	8		
5. Syntax Eval.		13		2	8		
6. Spch & Hearing Remediation	1-3	16	5	2	500		
7. Lngage Remed.		16	3	3	1000		
8. Remed. Math		8	4	1	300	1	
9. Remed. Algebra		7	3		200	2	
10. Int. to Coll. Alg.	3	4	4		140	1	
11. Coll. Algebra	5	2	2		70		
12. Plane Trigonom.	3	1	1		35		
13. Amer. Civiliza.	5	5	1	1	140	1	
14. Amer. Nat. Gov.	5	12	(Ivory provided all assist.)				8
15. Elem. Gen. Psych.	5	1	1		30	1	
16. Int. to Cultural Anthropology	5	1	1		18	1	
17. Elem. Bacteriol.	5	1	2		64	1	
18. Intro. Geology	5	1	1		30	1	
19. Intro. to Aud.-Spch Path	3	1	1		30	1	
20. Use of Libraries & Lib. Mater.	3	3	1		24	1	
21. Remed. Typing	2	2					
22. Tech. Drawing	3	1	1		56		
23. Elem. of Land Planng & Design	3	1					
24. Graphics	3	1					
25. Photo Fundament	3	1	1		30	1	
26. Intermed. Photography	3	1		1	30		
27. Phys. Ed. Courses	1-3	13					
28. Prod. of Audio-Visual Mater.	3	1					

E. Additional Facilitative Assistance. Non-academic services on campus have also given excellent support to the project. Part B in this report has referred to much of this extracurricular assistance. A cost analysis of many such services is included in Table 6.

Table 6. An analysis of the costs for a student to attend Utah State University during 1968-69.

	Type of Service	Cost			
		Fall	Winter	Spring	Year
1.	On campus housing with meals	$252	$252	$252	$756
2.	Nonresident tuition and fees*	281	281	281	843
3.	Books and supplies estimate	30	30	30	90
4.	Medical insurance	8	8	8	24
5.	On-Campus parking	3	3	3	9
6.	Recreation estimate	30	30	30	90
7.	Travel**, personnel effects,etc.	200	100	200	500
8.	Regular USU counseling	0	0	0	0
	Total =	$804	$704	$804	$2312

* $115/quarter for resident students
** less travel costs for resident students

Typically state rehabilitation agencies have provided considerable financial support towards the meeting of these costs. Part-time employment for those students desiring it constitutes another source of funds. Many such positions are available on campus although the competition is usually keen. The best possibilities for part-time employment for new students may be in areas of Work Study and on the project itself.

The Financial Aids Officer, Mr. John Williams, secured a Work Study position for one of our hard of hearing subjects. The project assisted has hired another one of the subjects this summer. It would have been helpful to have employment for another subject who neglected to buy needed course materials on at least two occasions because of lack of funds.

The plan for next year includes use of project funds wherever feasible for hiring hearing impaired students for part-time employment. All of the work for which these students will be reimbursed will be elated to helping themselves and their hearing impaired classmates succeed in academic study. It is anticipated that the work load carried by a given student will increase in step with academic competencies.

Other ways of reducing student costs at USU, while maintaining adequate academic conditions, include sharing an apartment off campus and travel to home areas. Four of the hearing impaired male students plan to share an off-campus cooking apartment next year. Possibilities for sharing travel costs are excellent inasmuch as the USU studentbody is represented by all states of mainland United States.

The intercollegiate athletic program draws many of these nonresident students and their friends. One of the hearing impaired students competed in intercollegiate athletics during the pilot year. Two others are excellent prospects being all-state in football and basketball respectively.

II. Comparison of Hard of Hearing Students and Hearing Students at Utah State University.

Sixteen normal hearing Freshman students at Utah State University were selected as subjects of a control group. These subjects were similar to the 16 hearing impaired students at USU in that they typically had very low scores in English and in Mathematics on the American College Testing examination. The comparative scores and corresponding grades appear in Table 7.

Table 7. English and Mathematics Grades for Hearing Impaired and Normal Hearing Students of Utah State University Having Similar Scores on the American College Testing Examination.

	USU Hearing Impaired Students					USU Freshman Hearing Students				
	ACT Percentiles		Grades		Total	ACT Percentiles		Grades		Total
Subject	English	Math	English	Math	GPA	English	Math	English	Math	GPA
1	01	01	---	PP	2.0	01	01	FF	P	1.3
2	01	01	---	---	1.2	01	01	FF	FP	1.0
3	01	46	F	CC	1.9	01	01	PD	D	0.4
4	01	01	F	FPP	1.4	01	01	PD	PP	1.1
5	01	01	F	P	1.4	01	01	FP	F	1.6
6	01	01	F	PP	3.0	03	06	FP	P	1.8
7	01	01	F	PP	2.5	03	02	FF	P	1.3
8	01	06	F	PP	2.1	03	02	PD	P	0.8
9	02	01	F	---	2.1	03	02	FP	P	1.5
10	03	11	F	PC	2.2	03	01	FP	F	2.0
11	03	11	F	PC	1.5	04	03	FF	P	1.5
12	04	16	F	PPC	1.8	04	01	FF	FF	2.3
13	15	12	?	B	3.5	05	05	FF	FF	2.5
14	15	48	CD?	---	1.3	05	05	FP	---	0.5
15	31	02	BCF*	F?P	1.7	15	01	P	---	2.8
16	50	54	?	A	3.0	22	21	CC	P	1.4
	Mode= 01	Mode= 01	Mode= F	Mode= P	Mean= 2.0	Mode= 01,03	Mode= 01	Mode= F	Mode= P	Mean= 1.3

* P indicates Pass and F indicates Fail on a Pass-Fail course for which No college credit is given except in the instance of an English grade for USU Subject 15.

Four conclusions may be drawn from this data as follows:

1. Hearing impaired students with very low ACT scores provided tutorial assistance perform academically as well or better than normal hearing students with very low ACT scores.

2. Both hearing impaired students and normal hearing students with low ACT scores can achieve at least satisfactorially in selected coursework in mathematics at Utah State University.

3. Both hearing impaired students and normal hearing students with low ACT scores experience considerable difficulty with the English requirement at Utah State University.

4. Greater emphasis should be given to upgrading the English facilitative aspect of the USU project for the hard of hearing.

The project objective to compare the pre-post year ACT scores of the USU experimental and control subjects was not met. Only 2 of the normal hearing subjects responded to a request to undergo a post-year ACT test. Many of those who did not respond apparently had dropped out of the university. Our project staff is making further investigation of the status of these students.

Comparison of grades achieved in the social science area was also made. The data indicated that a "D" grade was typical for both the hearing impaired students and the normal hearing students having low ACT scores. A reasonable explanation for the "D" grade seemed to be that the language level of many test questions was beyond the linguistic competencies of these students. Members of the project staff are testing this hypothesis further.

During the project year neither the hearing impaired students nor the normal hearing control group typically were advised to register for coursework in the natural sciences. One hard of hearing student did register for courses in geology and bacteriology. He achieved a "C" grade in one course. His grade in the other course is not as yet known. However, his pre-year ACT scores in science was in the 65th percentile. Strangely, his post-year ACT score was only in the 35th percentile.

III. Comparison of Hard of Hearing Students at Utah State University and Hard of Hearing Students at Gallaudet College.

The other project objective was to compare the yearly progress of a hard of hearing group at Utah State University with that of a control group at Gallaudet College in areas of academic study, vocabulary, and speech articulation. However, adequate comparisons could not be made because the hearing impaired student group at USU did not include enough subjects who met the criteria of the experimental plan. Even by the end of the project year, an insufficient number of hard of hearing subjects were enrolled at USU for pairing with the Gallaudet hard of hearing subjects. Nevertheless, much pre-post study data in all areas of comparison were obtained, and critical procedural problems were worked out. Except for speech articulation, which was recorded but remains to be analyzed, much of the data will be described briefly in this progress report.

Table 8 summarizes some of the pertinent information obtained on 16 hearing impaired students from Utah State University and 14 hard of hearing students from Gallaudet College.

Table 8. Some Pertinent Audiological, Psychological, and Academic Data on 30 Hearing Impaired Young Adults, 16 From Utah State University and 14 From Gallaudet College.

Sub.	USU Hearing Impaired Students Selected as Subjects					Gallaudet Students				
	dB Loss	Catell IQ	STEP reading %tile	PPVT Vocab.	Speech Artic. Problem	dB Loss	Catell IQ	STEP reading %tile	PPVT Vocab.	Speech Artic. Problem
1	67	108	.4-4	12-11	Moderate	73	122	04-15	11-4	Moderate
2	45	112	24-46	18-0+	Slight	87	116	06-19	10-10	Slight
3	65	95	24-46	18-0+	Mod-Sev	77	116	02-11	10-4	Sli-Mod
4	57	100	20-42	13-11	Slight	73	94	19-37	15-9	Sli-Mod
5	78	120	4-15	9-6	Mod	58	100	08-20	15-11	Very Sli
6	83	100	6-19	6-8	Ver Sev	58	100	01-08	10-0	Moderate
7	100+	90	.5-5	15-7	Moderate	67	119	04-15	10-9	Mod-Sev
8	100+	88	.4-4	11-0	Mod-Sev	84	116	08-20	15-3	Moderate
9	100	106	---	12-7	Sli-Mod	77	119	19-37	16-7	Sli-Mod
10	88	118	---	12-9	Sli-Mod	42	---	02-11	10-5	Sli-Mod
11	83	88	0	13-2	Mod-Sev	63	122	---	12-7	Moderate
12	60	100	---	18-0+	Moderate	72	100	---	12-1	Very Sli
13	92	96	.4-4	6-6	Mod-Sev	77	113	---	13-2	Sli-Mod
14	50	100	4-15	x	Sli-Mod	45	106	---	9-2	Sli-Mod
15	77	60	.5-5	6-6	Severe					
16	100+	107	0	7-1	Severe					
Mean:	78	99	6-16	12-3	Moderate	68	111	07-19	12-3	Sli-Mod

Only the first 5 USU students might be considered to have met pertinent criteria for selection as experimental subjects. They were hard of hearing, comparable to first year Gallaudet students academically and intellectually, and in attendance for at least 2/3 of the academic year.

The Gallaudet students were selected as being hard of hearing from the entire college preparatory-year class by Dr. Lyle Lloyd, Head of Audiological Services there. However, pre-post-year data on only 10 of these 14 hard of hearing subjects were obtained. Three of the remaining 4 dropped out of college and the fourth was absent on the day of the post-year academic test.

Pre-post-year percentile gains or losses on the Sequential Tests of Educational Progress (STEP) examination and on the Peabody Picture Vocabulary Test (PPVT) for 10 hard of hearing subjects from Gallaudet College may be seen in Table 9.

Table 9. Pre-Post-Year Percentile Gains or Losses On An Academic Test and On A Vocabulary Test For 10 Hard OF Hearing Subjects From Gallaudet College.

Control Subjects	Percentile Gains or Losses Per Month				Peabody Picture Vocabulary Test Percentile Gains or Losses Per Month
	Reading	Writing	Math	Science	
1	-0.8	1.3	1.7	0.4	-0.8
2	0	2.6	0.6	0.6	0.4
3	-0.3	-0.7	2.0	1.5	3.0
4	0.3	2.4	2.4	-2.0	5.4+
5	-0.2	1.6	-0.6	-1.3	1.6
6	1.0	3.2	2.0	0.6	0.2
7	0.4	0.4	1.3	0.4	0.2
8	-0.8	0.4	2.7	1.9	6.6+
9	-0.8	2.9	0.3	0.8	-0.4
10	-0.6	0.9	-0.2	2.1	1.6
Mean	-0.2	1.7	1.4	0.5	1.8

Additional forthcoming data from Gallaudet College may help to clarify the scores revealed in Table 9. Definite gains are especially noted in written composition and in mathematics where unusual emphasis is given during first-year study at Gallaudet College. For example, the students there are enrolled in mathematics classes that meet for two hours every weekday. The percentile losses in the reading subtest may not be significant. However, the pre-post-year difference, or rather lack of it, needs to be clarified.

Table 10 includes relevant data on the 5 experimental subjects from Utah State University.

Table 10. Pre-Post-Year American College Testing Examination and Peabody Picture Vocabulary Test Percentile Difference and Estimated Clock Hours of Classroom Instruction for 5 USU Hard Of Hearing Subjects.

Subject	ACT Percentile Gains or Losses Per Month				PPVT Percentile Gains or Losses Per Month	Estimated Clock Hours of Class Instruction				
	Eng.	Math.	Soc.Sc.	Nat.Sc.		Eng.	Math.	Soc.Sc.	Nat.Sc.	Tot
1	0	1.5	1.5	0.5	9.3	70	80	50	0	20
2	4.0	-1.0	-1.0	-3.2	0.6	85	0	135	45	26
3	0	-0.8	4.9	2.3	0.1	75	150	100	0	32
4	-2.2	1.6	-0.6	0.6	5.4	70	80	120	0	27
5	-0.3	2.6	0.1	-0.2	0	80	120	45	10	25
Mean	0.3	0.8	1.0	0	1.5	76	86	90	11	26

The data indicate a trend for the hard of hearing subjects at USU to improve academically in areas where classroom instruction was provided. Particular improvement seems to exist in areas of mathematics and social science in comparison to English and natural science. The score in vocabulary development seems to be similar to that of hard of hearing subjects at Gallaudet College as may be noted by comparing tables 9 and 10.

Throughout the pilot year the project staff noted that these hard of hearing subjects typically did not apply themselves to the university facilitative program as well as did hearing impaired students at USU with more severe hearing impairment. Table 11 includes a comparison of the academic application and grade point average of the 5 experimental subjects and 5 oral deaf students who were enrolled at Utah State University.

Table 11. Comparison of Academic Application and Grade Point Average of the 5 Hard of Hearing Subjects and 5 Oral Deaf Students at Utah State University.

Academic Application	Hard of Hearing Subject 1	2	3	4	5	Total	Oral Deaf Subject 1	2	3	4	5	Total
1. Seated self optimally	x		x		x	3	x	x	x	x	x	5
2. Utilized receptive speech optimally		x	x	x	x	4	x	x	x	x	x	5
3. Participated in class recitation where appropriate		x	x			2		x	x	x	x	4
4. Interviewed professors		x	x			2		x		x		2
5. Punctual and/or regular classroom attendance			x		x	2	x	x	x	x	x	5
6. Punctual and/or regular special study attendance					x	1	x	x	x	x	x	5
7. Studied sufficiently						0	x	x	x	x	x	5
Total	1	3	5	1	4	14	5	7	6	7	6	31
Grade point aver.	1.5	1.3	1.9	1.7	1.8	1.6	3.0	2.1	2.2	3.5	3.0	2.6
Hours graded	11	27	24	22	20	104	21	19	19	6	10	75
Catell I.Q.	108	112	95	100	120	107 (Mean)	100	90	88	106	118	100 (Mean)

It may be noted that the hard of hearing subjects showed much less educational initiative and obtained considerably lower grades than did the oral deaf students. The academic applications and grade-point averages for the hard of hearing were 14 of 35 and 1.6 respectively; for the oral deaf, 31 of 35 and 2.6 respectively. This data seem to indicate that a different facilitative strategy is necessary for the hard of hearing students in order to challenge their academic potentials.

SUMMARY AND FUTURE PLANS

This pilot project has demonstrated to us that it is feasible to develop an institute for the hard of hearing at a regular university. An exceptional potential of support lies untapped from administrative, faculty, and student sources. Although all objectives of the pilot study could not be attained, this past year, they can be realized within the context of the proposed 5-year continuation project. Procedural problems which presented difficulty have been worked out. And experimental subjects are becoming increasingly available as may be seen in Table 14.

Table 14. Progress on obtaining data on 30 prospective subjects for the USU Institute for the Hard of Hearing commencing September, 1969.

Subject	State	Applied USU	Admission Status	Hrng Loss	Available Perform IQ	ACT (USU percentile) Eng	Math	Soc Stud	Nat Sci	Comp	Voc Rehab Assist
P.A.	Minn	*		Prof							
G.A.	Ark										*
N.A.	Wash	*		Prof							
S.B.	Ore	*	*	Prof		25	52	23	12	21	*
R.B.	Minn	*		Sevr		11	02	09	15	04	
K.C.	Ore	*	*	Mod		69	46	59	77	66	*
D.C.	Wyo	*	*	Prof	102	01	11	03	03	01	*
R.C.	Mont			Sevr							
R.C.	Ariz	*	*	Prof	100	01	57	09	01	04	*
P.G.	Calif	*	*	Prof							?
S.G.	Flor	*		Prof	114						
M.G.	Ore	*	*	Sevr		06	28	05	39	11	*
R.G.	Ore	*	Audit	Mod	121	49	04	23	12	11	*
R.H.	Okl	*	*	Sevr	103	15	12	04	13	07	*
B.H.	N Y	*			108						
B.H.	Nev	*	Audit	Sevr	114	03	20	11	07	04	
D.H.	Nev	*									*
C.J.	Minn			Sevr	117	04	40	02	16	05	
P.J.	Utah	*	*	Mod	124	52	39	27	35	33	*
D.K.	Colo	*		Sevr							*
B.K.	Ore	*		Mod	114	25	34	19	12	16	*
J.L.	Calif	*	Audit	Sevr	100	01	01	01	01	01	
E.N.	Flor			Sevr	117						*
B.P.	Colo	*	*	Prof	98	50	54	48	56	55	*
P.S.	Mont	*	*	Sevr		06	22	05	09	05	*
K.S.	Calif	*	*	Sevr		05	46	11	04	08	*
W.S.	Ore	*	*	Sevr	104	08	28	01	06	04	*
J.S.	D.C.	*		Mild							
G.T.	Flor	*		Sevr							
W.W.	Colo	*	*	Sevr	127	01	39	03	03	03	*

Provided grant support is awarded from SRS to Utah State University for the proposed 5-year continuation study (RD-3272-S), our developing project staff will attempt to meet at least the following objectives during the next 5 years.

1. Develop a feasible educational model for the post-secondary habitation and education of hard of hearing individuals with academic potential. This model will encompass both lower division study and 4-8 specializations leading to undergraduate and graduate degrees.

2. Evaluate the effects of lower division study for the hard of hearing at USU by comparison with large matched groups of college students here and elsewhere including the normal hearing, the hard of hearing, the oral deaf, and the manual deaf. The pilot-year goals which were not attained would be completed under this more inclusive objective.

3. Develop and evaluate promising new remedial strategies and devices for the improvement of oral communicative competencies. One aspect of this development and evaluation is described in the RD-3272-S grant proposal as a comparison of a conventional and an experimental remedial speech program for hard of hearing and oral deaf subjects.

4. Develop and evaluate optimal amplification-acoustical classroom conditions for the facilitation of auditory identification of speech signals by the hearing impaired.

5. Program self-instructional materials that will upgrade the secondary and post-secondary competencies of the hearing impaired. We have proposed to Media Services and Captioned Films, Office of Education, that we be considered as the site of a Western Regional Media Center for the Deaf.

6. Develop our working relationships with Gallaudet College, the National Technical Institute for the Deaf, and other post-secondary programs for the hearing impaired. Cross referrals from Mr. Bernard Greenberg, Director of Admissions at Gallaudet College, from Dr. J. R. Clarcq, Director of Division of Student Development at NTID, and the USU project director are developing.

We anticipate that a Regional Institute for the Hard of Hearing will be established at Utah State University. This development will occur within the context of the new Educational Audiology specialization being pioneered at Utah State University. The Office of Education is providing at least $35,000 training grant support for 1969-70 to the new EA specialization or area of the hard of hearing. The Head of the Department of Audiology-Speech Pathology, Dr. Jay R. Jensen, recently generated a document relative to future programming. This document revealed that the Department of Audiology-Speech Pathology could move from the current M.S. degree program to the Ph.D., with specialization in Educational Audiology, within the next 5 years. Currently, the department has enrolled approximately 60 undergraduate students and 20 full-time graduate students.